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10/693,953	10/28/2003	Daniel G. O'Connell	OCEANIT	3655

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EXAMINER

GEISEL, KARA E

ART UNIT PAPER NUMBER

2877

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/693,953

Applicant(s)

O'CONNELL, DANIEL G.

Examiner

Kara E. Geisel

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13-18, 20, 22, 23, 25-42, 45-51, 53, 55-65 and 68-85 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 19, 21, 24, 43, 44, 52, 54, 66, 67, 86 and 87 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0405, 0505</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)).

Although there is reference to application number 10/290,528 being related to this application in the specification, it is not disclosed how these applications are related. In order to obtain priority benefits, applicant must disclose relation.

### ***Information Disclosure Statement***

The information disclosure statement filed April 21<sup>st</sup>, 2005 and May 2<sup>nd</sup>, 2005 have been considered by the examiner.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, the parenthesis in line 1 renders the claim indefinite because it is unclear whether the limitation(s) inside the parenthesis are part of the claimed invention. See MPEP § 2173.05(d).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 15-16, 18, 20, 22-23, 29-30, 36-39, 48-49, 51, 53, 55-56, and 79 are rejected under 35 U.S.C. 102(b) as being anticipated by Ruddle et al. (USPN 4,415,405).

In regards to claim 1, Ruddle discloses a method for analyzing a medium, and a cell containment apparatus comprising a cell tray comprising a substrate, a multi-dimensional array of apertures on the substrate (fig. 1), a medium disposed in the apertures for monitoring, analyzing and processing properties of the medium (column 1, lines 10-16).

In regards to claims 2, 36 and 48, the apertures are cell wells (column 1, lines 10-16).

In regards to claim 3, each cell well is disposed equidistant from an adjacent cell in an orthogonal direction (fig. 1).

In regards to claim 4, the array is two-dimensional array (fig. 1).

In regards to claims 5-7, and 37-39, the material can be any material desired by the user.

In regards to claims 15-16 and 49, the substrate is an optical substrate having optimal transmission in all regions of an electromagnetic spectrum (column 2, lines 47-57).

In regards to claims 18 and 51, the substrate comprises a photoresist coating (column 1, lines 40-47).

In regards to claims 20 and 53, the apparatus further comprises a lithographic shadow mask forming the apertures on the photoresist coating (column 2, lines 28-36).

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In regards to claims 22-23 and 55-56, a two-dimensional ordered array of shaped regions formed on the photoresist coating have geometric shapes selected from the group consisting of circles, triangles, square, rectangles (fig. 1).

In regards to claim 29, the substrate is a uniform flat surface (fig. 1).

In regards to claims 30 and 79, the substrate is a microscope slide or cover slip (fig. 1).

Claims 1-7, 36-39, 48, and 73 are rejected under 35 U.S.C. 102(b) as being anticipated by Kasahara (USPN 6,238,911).

In regards to claim 1, Kasahara discloses a method for analyzing a medium, and a cell containment apparatus comprising a cell tray (fig. 3) comprising a substrate, a multi-dimensional array of apertures on the substrate (11a), a medium disposed in the apertures for monitoring, analyzing and processing properties of the medium (13).

In regards to claims 2, 36 and 48, the apertures are cell wells (11a).

In regards to claim 3, each cell well is disposed equidistant from an adjacent cell in an orthogonal direction (fig. 4B).

In regards to claim 4, the array is two-dimensional array (fig. 4B).

In regards to claims 5-7, and 37-39, the material can be any material desired by the user.

In regards to claim 73, the imaging further comprises integrating the cell tray with a microscope objective lens array (12), disposing the lens array above a sample of interest (13), and processing and analyzing the sample of interest (column 2, lines 32-36).

Claims 1-7, 15-18, 29-30, 32-34, 36-39, 48-50, 62, and 79-83 are rejected under 35 U.S.C. 102(e) as being anticipated by Schueller et al. (US Pubs 2003/0020915).

In regards to claim 1, Schueller discloses a method for analyzing a medium, and a cell containment apparatus (fig. 2) comprising a cell tray (10) comprising a substrate (14), a multi-

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dimensional array of apertures on the substrate (22), a medium disposed in the apertures for monitoring, analyzing and processing properties of the medium (page 4, ¶s 43-44 and page 5, ¶s 56-57).

In regards to claims 2, 36 and 48, the apertures are cell wells (22).

In regards to claim 3, each cell well is disposed equidistant from an adjacent cell in an orthogonal direction (page 2, ¶ 15).

In regards to claim 4, the array is a linear array (fig. 2a, 22).

In regards to claims 5-7, and 37-39, the material can be any material desired by the user (page 5, ¶ 56).

In regards to claims 15-16 and 49, the substrate is an optical substrate having optimal transmission in all regions of an electromagnetic spectrum (page 2, ¶ 32).

In regards to claims 17, 50, and 62, the material of the optical substrate is selected from the group consisting of fused silica, soda lime glass, borosilicate glass, PMMA, sapphire, silicon, germanium, and combinations thereof (page 5, ¶ 52).

In regards to claims 18 and 51, the substrate comprises a photoresist coating (page 5, ¶ 50).

In regards to claim 29, the substrate is a uniform flat surface (14).

In regards to claims 30 and 79, the substrate is a microscope slide or cover slip (14).

In regards to claim 32 and 80, the cell wells are micro-channels etched into the substrate for delivering the medium to each cell well (fig. 2A, 22).

In regards to claims 33, and 81-82, the apparatus further comprises a delivery manifold, substances in the manifold, and fluid channels on the substrate connecting the manifold and the cell wells for delivering the substance to the cell wells (page 4, ¶s 46-48).

In regards to claims 34 and 83, the material can be any material desired by the user (page 5, ¶ 56).

Claims 1-10, 13-14, 16-17, 29, 35, 36-42, 45, 48, 50, 62, 68-69, and 85 are rejected under 35 U.S.C. 102(e) as being anticipated by Kuebler et al. (USPN 6,519,032).

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In regards to claim 1, Kuebler discloses a method for analyzing a medium, and a cell containment apparatus (fig. 2) comprising a cell tray (202) comprising a substrate, a multi-dimensional array of apertures on the substrate (20), a medium disposed in the apertures for monitoring, analyzing and processing properties of the medium (column 21, lines 4-49).

In regards to claims 2, 36 and 48, the apertures are cell wells (20).

In regards to claim 3, each cell well is disposed equidistant from an adjacent cell in an orthogonal direction (fig. 4A).

In regards to claim 4, the array is two dimensional array (fig. 2a, 22).

In regards to claims 5-7, and 37-39, the material can be any material desired by the user (page 5, ¶ 56).

In regards to claims 8, 40, and 68, the apparatus further comprises a probe disposed proximal the substrate for simultaneously monitoring, analysis, and processing of the medium in each cell well (fig. 2, 420, column 20, lines 20-29 and 58-61).

In regards to claims 9, 41, and 85, the probe is an array of probes (fig. 2, 420, 420'...) for parallel processing of the medium in each of the wells (column 20, lines 20-29 and 58-61).

In regards to claims 10 and 42, the probe can include any type of detection means, including a precision optical intracellular near field imaging microscope (column 6, lines 56-62).

In regards to claims 13-14, 45 and 69, the array of probes have spacings between the probes similar to spacings between the cell wells (fig. 2), and wherein one probe of each of the array of probes monitors processes and analyzes the medium in one of the cell wells proximal the one probe, and the array or probes parallelly monitor, process, and analyze the medium in the cell wells as desired (column 20, lines 20-61).

In regards to claim 16, the substrate is an optical substrate (column 37, lines 23-65).

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In regards to claims 17, 50, and 62, the material of the optical substrate is selected from the group consisting of fused silica, soda lime glass, borosilicate glass, PMMA, sapphire, silicon, germanium, and combinations thereof (column 37, lines 23-65).

In regards to claim 29, the substrate is a uniform flat surface (column 37, lines 54-63).

In regards to claim 35, the cell tray is a square ordered array of cells (fig. 4A).

Claims 1-2, 4-7, 25, 36-39, and 48 are rejected under 35 U.S.C. 102(e) as being anticipated by Hammerick et al. (US Pubs 2002/0173033).

In regards to claim 1, Hammerick discloses a method for analyzing a medium, and a cell containment apparatus (fig. 3) comprising a cell tray (12) comprising a substrate, a multi-dimensional array of apertures on the substrate (26), a medium disposed in the apertures for monitoring, analyzing and processing properties of the medium (page 1, ¶s 3-4).

In regards to claims 2, 36 and 48, the apertures are cell wells (26).

In regards to claim 4, the array is two-dimensional array (fig. 3).

In regards to claims 5-7, and 37-39, the material can be any material desired by the user (page 5, ¶ 56).

In regards to claims 18 and 51, the substrate comprises a photoresist coating (page 6, ¶s 105-116).

In regards to claim 25, the cell wells have different well depths (pages 8-9, ¶ 153).

Claims 1-2, 4-7, 26-28, 31, 36-39, 46-48, 70-72, 74-78 and 84 are rejected under 35 U.S.C. 102(e) as being anticipated by Clements et al. (US Pubs 2005/0047971).

In regards to claim 1, Clements discloses a method for analyzing a medium, and a cell containment apparatus (fig. 1) comprising a cell tray (10) comprising a substrate (13), a multi-dimensional array of apertures on the substrate (14), a medium disposed in the apertures for monitoring, analyzing and processing properties of the medium (page 1, ¶s 3-4).

In regards to claims 2, 36 and 48, the apertures are cell wells (14).



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In regards to claim 4, the array is two-dimensional array (fig. 1).

In regards to claims 5-7, and 37-39, the material can be any material desired by the user (page 1, ¶ 2).

In regards to claims 26-28, 46-47, and 70-72 there can be optical lenses at the bottom of each of the wells, wherein the lenses can be micro-machined diffractive or Fresnel lenses (pages 3-4, ¶ 41).

In regards to claims 31 and 74, the substrate can be an invar backing plate comprising clear apertures for viewing transmission (pages 3-4, ¶ 41).

In regards to claims 75-78, mounting the cell tray comprises forming a mechanical support and maintaining a uniform flat surface (page 2, ¶ 12), indexing each well with an automation system, and monitoring the medium of interest, in transmission or reflection mode microscopes and spectrometer configurations (page 1, ¶ 6) in UV, visible, and IR regions of the electromagnetic spectrum.

In regards to claim 84, forming the cell tray with the substrate comprises forming an integrated microptic chip on an optical wafer substrate (fig. 4).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 57-61, and 63-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hammerick et al. (US Pubs 2002/0173033).

In regards to claims 57-61, Hammerick generally discloses that the application process of the photoresist to be exposing the photoresist to a light source, retaining unexposed portions as surface structures, exposing with positive or negative processes, and using a lithography to form the cell wells

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(page 6, ¶s 104-114). Hammerick is silent to the type of light source used, and type of lithography, however the examiner takes Official Notice, that laser and broadband white light source are well known sources for exposing a photoresist, and e-beam and deep UV are well known types of lithography used to form trenches in a substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the light source in Hammerick's process be a laser or broadband white light source for exposing a photoresist, and the type of lithography be e-beam and deep UV in order to form trenches in the substrate.

In regards to claims 63-64, the processing comprises processing photoresist patterns on the substrate with reactive ion etching procedure, differentially etching the substrate and the photoresist layer, and etching features into the substrate deeper than a thickness of a photoresist layer (fig. 4, page 6, ¶s 104-114) so that there are various well depths of the cell wells (page 9, ¶153).

In regards to claim 65, the etching comprises etching with a fluorine based chemical etchant (page 15, ¶ 264).

*Allowable Subject Matter*

Claims 11-12, 19, 21, 24, 43-44, 52, 54, 66-67, and 86-87 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claims 11 and 43, the prior art of record, taken alone or in combination, fails to disclose or render obvious a cell containment apparatus or method for analyzing a medium wherein a spectroscope comprises a nanosensor array of probes for non-invasively imaging sub-cellular and molecular inner regions of the medium being analyzed without destruction of the medium, in combination with the rest of the limitations of claims 11 and 43.

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As to claims 19 and 52, the prior art of record, taken alone or in combination, fails to disclose or render obvious a cell containment apparatus or process for fabricating a cell containment device comprising a crossed grating pattern of Ronchi grating on a photoresist coating, in combination with the rest of the limitations of claims 19 and 52.

As to claims 21 and 54, the prior art of record, taken alone or in combination, fails to disclose or render obvious a cell containment apparatus or process for fabricating a cell containment device comprising a crossed grating interference pattern on a photoresist coating formed by holographic exposure, in combination with the rest of the limitations of claims 21 and 54.

As to claim 24, the prior art of record, taken alone or in combination, fails to disclose or render obvious a cell containment apparatus comprising an intermediate layer between a substrate and a photoresist coating, in combination with the rest of the limitations of claim 24.

As to claim 66, the prior art of record, taken alone or in combination, fails to disclose or render obvious a process for fabricating a cell containment device comprising forming deeper cell wells by disposing an intermediate layer between the substrate and the photoresist layer, in combination with the rest of the limitations of claim 66.

As to claim 86, the prior art of record, taken alone or in combination, fails to disclose or render obvious a process for fabricating a cell containment device wherein integrating comprises integrating near-field probes at a base of the lenses in a the cell wells, imaging intra-cellular structure in the medium of interest with a sub-wavelength resolution imaging and spectroscopy, coupling the integrated probe and the cell tray to a precision focus control device, and directly viewing inside the medium of interest by non-invasively penetrating a membrane on the medium of interest, and imaging insides of an intact medium without destroying the structure, in combination with the rest of the limitations of claim 86.

### *Conclusion*

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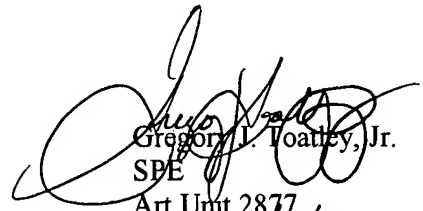
Several facts have been relied upon from the personal knowledge of the examiner about which the examiner took Official Notice in this Office Action mailed. Applicant must seasonably challenge well known statements and statements based on personal knowledge when they are made by the Board of Patent Appeals and Interferences. In re Selmi, 156 F.2d 96, 70 USPQ 197 (CCPA 1946); In re Fischer, 125 F.2d 725, 52 USPQ 473 (CCPA 1942). See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice). If applicant does not seasonably traverse the well-known statement during examination, then the object of the well-known statement is taken to be admitted prior art. In re Chevenard, 139 F.2d 71, 60 USPQ 239 (CCPA 1943). A seasonable challenge constitutes a demand for evidence made as soon as practicable during prosecution. Thus, applicant is charged with rebutting the well-known statement in the next reply after the Office action in which the well-known statement was made.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kara E Geisel whose telephone number is 571 272 2416. The examiner can normally be reached on Monday through Friday, 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571 272 2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571 273 8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Gregory L. Toatley, Jr.  
SPE  
Art Unit 2877  
20 March 2006

K.G.

KEG  
March 16, 2006